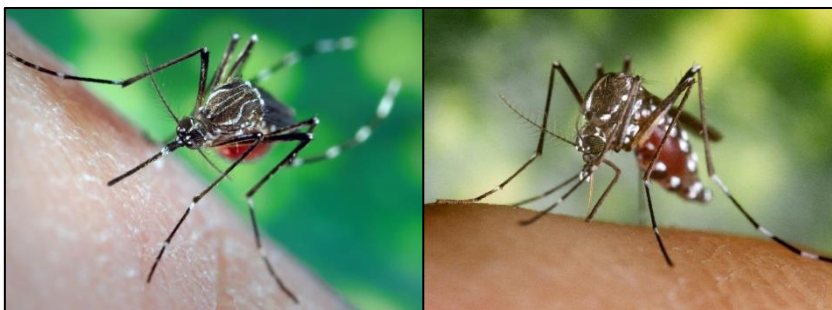


Just the Facts...

Dengue [DEN-ghee] is a flu-like viral disease spread by the bite of infected mosquitoes. Dengue is caused by one of the four related viruses (DEN 1, DEN 2, DEN 3 and DEN 4). All types of dengue virus are re-emerging worldwide and causing larger and more frequent epidemics, especially in cities in the tropics. The emergence of dengue as a major public health problem has been most dramatic in the Western Hemisphere. Dengue has reached epidemic levels in Central America and is a threat to the United States. It is endemic in Puerto Rico, the U.S. Virgin Islands, Samoa, and Guam. Outbreaks have occurred in Hawaii, Florida, and Texas. It is also found in Africa, Asia, the Pacific, Australia, and South America.

How do people become infected with dengue virus?

Dengue is most often spread to people by *Aedes aegypti* and *Aedes albopictus* mosquitoes, while *Aedes polynesiensis* and *Aedes scutellaris* have a limited ability to serve as vectors. They are aggressive daytime biters with peak activity at dawn and dusk. They will bite indoors, around the outside of homes, and even at night if the lights are on. If a mosquito bites an infected person, it can later spread the disease to another person by biting them. People cannot become sick through physical contact with a dengue-infected person. Dengue is most common in cities but can also be found in rural areas. It is rarely found in mountainous areas above 4,000-foot elevation. Most U.S. cases occur in travelers returning from abroad, but the dengue risk is increasing for people living along the Texas-Mexico border and in other parts of the southern United States.



Aedes aegypti (left) and *Aedes albopictus* (right). These mosquitoes are important transmitters of dengue. Both are aggressive daytime biters which readily feed on humans. *Ae. aegypti* is the most important vector in tropical climates and *Ae. albopictus* plays a more significant role in temperate areas. Photos: CDC

What are the signs and symptoms of dengue and dengue hemorrhagic fever?

Dengue symptoms usually start suddenly with a high fever and at least two of the following: severe headache, severe pain behind the eyes, muscle and/or bone pain, rash, or joint pain. The severity of the joint pain has given dengue the name "breakbone fever." Nausea, vomiting, and loss of appetite are common. A rash usually appears 3 to 4 days after the start of the fever. The illness can last up to 10 days, but complete recovery can take as long as a month. Older children and adults are usually sicker than young children. Most dengue infections result in relatively mild illness, but some can progress to dengue hemorrhagic fever. In this form of the disease, the blood vessels start to leak, causing bleeding from the nose, mouth, and gums. Bruising can be a sign of bleeding inside the body. Without prompt treatment, the blood vessels can collapse causing shock (dengue shock syndrome). Dengue hemorrhagic fever is fatal in about 5 percent of cases, mostly among children and young adults. Infection with dengue does not build immunity against a second infection and actually puts personnel at greater risk for developing dengue hemorrhagic fever if infected again.

Is there a treatment for dengue and dengue hemorrhagic fever infections?

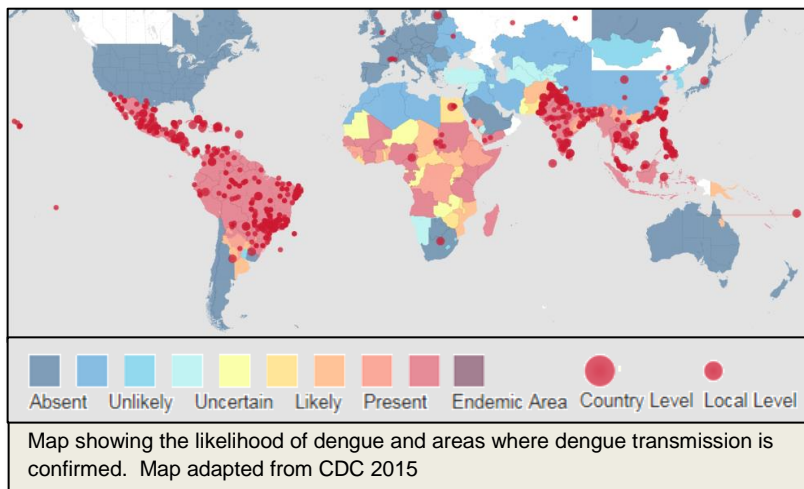
There is no specific treatment for dengue. Infected individuals or people exhibiting symptoms should be kept away from mosquitoes for the protection of others. Supportive care for dengue hemorrhagic fever includes rest and replacing lost fluids. Some patients may need transfusions to control bleeding.

What should I do if I think I have dengue?

Seek medical attention if you experience the symptoms described above and have traveled to an area where dengue occurs. Be sure to tell your healthcare provider your recent travel history. If you think you have dengue, avoid mosquito bites to prevent the virus from spreading to others.

How soon do symptoms appear after exposure?

It usually takes 4 to 7 days for symptoms to start after being bitten by a dengue-infected mosquito, but symptoms can start as quickly as 3 days, or take as long as 14 days to appear. An infected person cannot spread the infection to other people through contact but can be a source or



reservoir of dengue virus for mosquitoes. This reservoir period begins shortly before the person starts to experience symptoms and lasts for about 5 days.

What can I do to reduce my risk of becoming infected with dengue virus?

AVOID MOSQUITO BITES! Using the DoD Insect Repellent System provides the best protection from mosquito bites. It incorporates permethrin repellent on the uniform, DEET or picaridin repellent on exposed skin, a properly worn uniform, and sleeping inside a permethrin-treated bed net.

Another important preventive measure is to eliminate mosquito breeding sites. Do not allow water to accumulate in containers. Outdoors, mosquitoes breed in discarded tires, flowerpots, old oil drums, and water storage containers close to human dwellings. Indoors, look for standing water, such as in vases with fresh flowers or lucky bamboo. Water containers should be emptied at least once a week to prevent mosquito development. Stay in air-conditioned areas or make sure your door and window screens do not have holes. Minimize time outdoors after dawn and before dusk, which are the peak biting times for the *Aedes spp.* mosquitoes that transmit dengue.

How do I know if my uniform is treated with permethrin repellent?

Factory-treated permethrin Army Combat Uniforms (ACU Permethrin) are now available to all Soldiers. The ACU Permethrin trouser and coat will have a sewn-in label indicating the uniform is factory-treated with permethrin. If not factory-treated, Soldiers can field-treat using either the IDA Kit (NSN 6840-01-345-0237), which can last up to 50 washings, or the 0.5% aerosol spray can (NSN 6840-01-278-1336), which should be reapplied after 6 weeks and the sixth washing. When applying permethrin, always read and follow the label directions. Permanently mark the uniform label with the permethrin field-treatment date. **Never apply permethrin to the skin.** Aerosol products containing 0.5% permethrin and clothing factory-treated with permethrin are also commercially available for Civilian use.

What standard military insect repellent products are available for exposed skin?

Approved military insect repellents for use on exposed skin come in a variety of formulations. Always refer to the label to determine frequency of repellent application based on activity. **Do not apply repellent to eyes, lips, or to sensitive or damaged skin.** Available military repellents are:

- **Ultrathon™** (NSN 6840-01-284-3982) contains 33% controlled-release DEET lotion; one application protects for 12 hours.
- **Ultra 30™ Insect Repellent Lotion** (NSN 6840-01-584-8393) contains 30% Lipo DEET; one application protects for up to 12 hours.
- **Cutter® pump spray** (NSN 6840-01-584-8598) contains 25% DEET; one application protects for up to 10 hours.
- **Sunsect** combination sunscreen & repellent (NSN 6840-01-288-2188) contains 20% DEET with SPF 15 sun protection.
- **Natrapel® pump spray** (NSN 6840-01-619-4795) contains 20% picaridin; one application protects for up to 8 hours.



All standard approved skin repellents contain the active ingredient DEET or picaridin, and are registered by the U.S. Environmental Protection Agency (USEPA). These products are safe to use and effectively repel mosquitoes, sand flies, fleas, ticks and other potential disease vectors and pests. Photo: VID, APHC

What is considered a “properly worn combat uniform”?

Worn properly, military combat uniforms act as a physical barrier against insects, ticks, and other disease transmitters and biting nuisance pests. Wear uniforms with the sleeves rolled down; tuck pants into boots and undershirt into pants. Wear uniform loosely since mosquitoes can bite through fabric that is pulled tight against the skin. A permethrin-treated uniform does not provide protection to exposed skin; protect exposed skin with an approved insect repellent.

What standard bed nets are available to help protect Soldiers from mosquito bites while sleeping?

Treated bed nets provide a barrier between a sleeping Soldier and pests (e.g., mosquitoes/ticks). Lightweight, self-supporting, pop-up bed nets factory-treated with permethrin are available in coyote brown (NSN 3740-01-518-7310) or green camouflage (NSN 3740-01-516-4415). The newly released Egret bed net (NSN 3740-01-644-4953) will also protect against mosquitoes and has a higher ceiling. Untreated mosquito bed nets (NSN 7210-00-266-9736) should be treated with 0.5% permethrin aerosol spray and assembled properly on a cot. Check for holes in the netting, and keep loose edges off the ground by tucking them under the sleeping bag.

Where can I get more information on dengue?

- The Armed Forces Pest Management Board Technical Guide 47 – *Aedes* Mosquito Vector Control: <http://afpmb.org/content/technical-guides>
- Centers for Disease Control and Prevention dengue website: <http://www.cdc.gov/dengue/>
- Local county or state health departments

